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10/825,756	04/16/2004	Sara Oueslati	33901-147	8513

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EXAMINER	
SEFCHECK, GREGORY B	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/825,756	OUESLATI ET AL.	
	Examiner	Art Unit	
	GREGORY B. SEFCHECK	2619	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 June 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8,10-12,14-26,28-30 and 32-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *38 and 39* is/are allowed.

6)☒ Claim(s) *1-8,10-12,14-26,28-30 and 32-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

- Applicant's Request for Continued Examination filed 6/9/2008 is acknowledged.
- Claims 1 and 19 have been amended.
- Claims 9, 13, 27, and 31 have been cancelled.
- Claims 1-8, 10-12, 14-26, 28-30, and 32-39 remain pending.

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 4-7, 12, 22-25, and 30 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

Claims 4-7 and 22-25 contain limitations directed to a "list of protected flows" that is different than the "list of active flows" cited in the scheduling means limitation of claims 1 and 19, respectively. However, the Specification only describes one list 30 of protected flows, defined as flows that are admitted and active. Thus, the Specification refers to a single list as a list of active, or protected, flows, rather than the two separate lists claimed by Applicant. Further, claims 12 and 30 contain limitations to "a list of active flows" rather than "the/said list of active flows".

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-37 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Independent claims 1 and 19 contain limitations specifying the scheduling of packets as either "priority" or "non-priority". Claims 1 and 19 also contain limitations which give "priority" to a next packet of a flow that has been erased from the list of active flows. Further, claims 1 and 19 contain limitations assigning "a priority" to the packet of flows for which a bit rate is below a dynamic threshold.

Claims 1 and 19 are indefinite because they do not adequately differentiate between these differently claimed priorities.

Claims 2-8, 10-12, 14-18, 20-26, 28-30, and 32-37 are rejected based upon their dependence from claims 1 and 19, respectively.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-7, 17-25, 36, and 37 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (US 7126918B2) in view of Sundqvist (US20010023453A1).

- Regarding Claims 1 and 19,

Roberts discloses methods and devices for micro-flow management at switches in a communication network (Title; Fig. 2; claim 1,19 – device/method for processing packets of flows on a network link).

Roberts discloses each switch 220 within network 200 schedules packets across the switch core by relying upon a weighted (priority) fair queuing technique to adjust the transmission rate of packets of each microflow in order to maintain fairness among the various flows while meeting quality-of-service (QoS) parameters of the micro-flow contained and extracted from the packet header (Fig. 3A-5; Col. 10, lines 54-57; claim 1,19 – scheduling means/step for scheduling packets in a queue in accordance with a fair queuing with priority algorithm).

Roberts further discloses micro-flow recognizer 520 which constructs (writes) a new flow block in the flow block table 570 if the flow is not already in the table (Col. 12-

13, lines 64-15). Roberts also discloses a micro-flow timeout period in which a micro-flow is terminated (erased from the list) if a packet belonging to the flow is not received after a certain period of time (Col. 8, lines 28-32; Col. 9, lines 63-65; claim 1,19 - means for writing flows in and erasing flows from the list of active flows as a function of the arrival and departure of packets of the flows, said means being configured to erase from the list of active flows a flow which has not had any packets in the queue for a certain time period).

Roberts discloses ensuring quality of service based upon the rate requirement (available rate, maximum rate, or guaranteed rate) specified for the particular flow (Fig. 3B; Col. 8-9, lines 59-5). Roberts discloses a weighting factor W (priority) is set for available rate (AR) flows indicating how much of a portion of an AR rate can be delegated compared to other flows (Col. 10, lines 24-36). The available rate is defined as a rate below the dynamically calculated guaranteed rate (GR) of a particular flow, where QoS rates are maintained for each flow based upon the available capacity (traffic conditions) of the network (Col. 10-11, lines 53-6; Col. 13, lines 60-67; claim 1,19 – a priority is assigned to the packets of the flows for which a bit rate is below a dynamic threshold determined by traffic conditions).

Roberts discloses packets not belonging to an existing flow in flow block table 570 are scheduled by constructing a new flow block in table 570 with corresponding QoS values (defining the QoS class) of the flow extracted (discriminated) from the received packet, thereby defining how subsequently received packets of the same flow

are processed (Fig. 6; Col. 3-4, lines 60-8; Col. 13-14, lines 12-13). However, Roberts does not explicitly disclose scheduling packets of flow not identified in a list of active flows as priority packets and packets already identified in the list of active flows as non-priority packets, wherein erasing a flow would give priority to the next packet of the flow.

Sundqvist discloses a method and arrangement for flow control (Title). Sundqvist discloses one embodiment in which new data flows are given a default of the highest priority when introduced to the switch (Pg. 5-6, paragraphs 50-52; claim 1,19 - schedule as priority packets any packets of flows in the queue that are not identified in a list of active flows and as non-priority packets any packets of flows that are already identified in the list of active flows).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by prioritizing packets of flows in the queue that are not identified in a list of active flows, relative to packet of flows already identified in the list of active flows, as shown by Sundqvist. This would ensure that the packets are treated according to the specified QoS of the flow, even if the QoS of the flow has not yet been determined.

- Regarding Claims 2, 3, 20 and 21,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Referring to Fig. 5, Roberts discloses packets are received at the network trunk line interface according to various layered protocols (Col. 12, lines 35-48; claim 2,20 –

admission control means/step for controlling admission of packets into device in accordance with admission criteria).

Roberts also shows received packets processed for admission to the switch based upon information input from policing scheduler 540 and policy table 580 (Fig. 5, 7; Col. 13-14, lines 12-53; claim 3,21 – scheduling means/step for sending admissibility condition data to the admission control means).

- Regarding Claims 4 and 22,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts further discloses micro-flow recognizer 520 searches (interrogates) the flow block table 570 to determine if the flow block exists (Col. 12, lines 49-67; claim 4,22 - admission means comprise means for interrogating a list of protected flows for each incoming packet).

- Regarding Claims 5 and 23,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses a micro-flow timeout period in which a micro-flow is terminated if another packet belonging to the flow is not received after a certain period of time (Col. 9, lines 63-65; claim 5,23 – means/step for erasing flows for which the time elapsed since the last packet was received exceeds a threshold value from the list of flows).

- Regarding Claims 6, 7, 17, 24, 25, and 36,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses determining whether a flow block already exists for a received packet by searching the flow block table 570. Packets not belonging to an existing flow in flow block table 570 are scheduled by constructing a new flow block in table 570 with corresponding QoS values (defining the QoS class) of the flow extracted (discriminated) from the received packet, thereby defining how subsequently received packets of the same flow are processed (Fig. 6; Col. 3-4, lines 60-8; Col. 13-14, lines 12-13; claim 6,24 – admission means comprise means for determining if the admission criteria are satisfied if a packet belongs to a flow that is not in the list of protected flows; claim 7,25 – means for entering a new flow in the list if the admission criteria are satisfied; claim 17,36 – discrimination means for distinguishing classes of service at admission control level).

- Regarding Claim 18 and 37,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses fairness scheduling (load sharing) of multiple flows over multiple links of network 200 (Fig. 2) based upon identification of a flow. Roberts discloses the flow identification is achieved by generating a hash key with the network

layer and transport layer information of a flow's packet (address attributes; Col. 12, lines 54-57; claim 18 – flows are identified by a hashing function applied to address attributes; claim 37 – load sharing of flows over a plurality of links is effected with the aid of a function of address attributes including the free portion of the flow identifier).

7. Claims 10-12, 14, 16, 28-30, 32, and 34 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Sundqvist, as applied to claims 1 and 20 above, and further in view of Hui (US 20040151197A1).

- Regarding Claims 10, 16, 28, and 34,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose scheduling packets in a PIFO queue or determining the presence of packets in the queue.

Hui discloses per-flow queuing in a shared memory switch architecture in which the priority of packets is represented by queuing elements having a priority level determined by a weighted fair queue algorithm (Abstract). Hui discloses calculating (scheduling) a departure time through packet buffer 730 for each new packet received for each flow, under control of multi-FIFO controller 725, based upon the value of time stamps (Pg. 1, paragraph 8; Pg. 3, paragraph 41; Pg. 6, paragraph 70-71; claim 10,28 – schedule packets in a PIFO queue). Hui discloses rowmin and global min logic of the switch identifies the packets and their corresponding priority stored in the switch,

therefore also operable to identify when there are no packets in the switch (Pg. 2, paragraph 16; claim 16,34 – means for determining whether the PIFO queue is empty).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by scheduling packets through management of a PIFO queue, as shown by Hui, thereby ensuring that the highest priority packet of a respective flow is transmitted when the flow's corresponding port is granted access to the transmission medium.

- Regarding Claims 11 and 29,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose maintaining a pointer to identify the last of the priority packets at the head of the queue.

Hui discloses queuing elements in which the priority value of the last packet of each flow is maintained for determining the priority of the new packet (Fig. 4, step 405; Fig. 7, VCold; Pg. 4, paragraph 44; claim 11,29 – pointer P identifies the last of the priority packets at the head of the queue).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by utilizing the last of the priority packets in the queue for determining the priority of the newly received packet, as shown by Hui, thereby maintaining fairness in assigning priority to packets from various flows.

- Regarding Claims 12 and 30,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses employing flow block table 570 to determine existing (active) flows into the switch (Col. 12, lines 64-67; claim 12,30 – employ a list of active flows containing identifiers of the active flows).

Roberts does not explicitly disclose the use of a time stamp for scheduling packets.

Hui discloses per-flow queuing in a shared memory switch architecture in which the priority of packets is represented by queuing elements having a priority level determined by a weighted fair queue algorithm (Abstract). Hui discloses calculating (scheduling) a departure time for each new packet received for each flow, under control of multi-FIFO controller 725, based upon the value of time stamps (Pg. 1, paragraph 8; Pg. 3, paragraph 41; Pg. 6, paragraph 70-71; meets claim 12,30 - time stamp is used for scheduling packets)

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by scheduling packets using a time stamp, as shown by Hui. This would ensure that the time constraints related to the QoS of packets are adhered to in scheduling data through the switch.

- Regarding Claims 14 and 32,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Referring to Fig. 9, Roberts discloses the ability to measure the traffic of the network to determine when to discard packets to avoid congestion as the rate of respective flows are adjusted (Col. 16, lines 48-67; claim 14,32 – means for measuring congestion).

8. Claims 15 and 33 (as best understood) are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Sundqvist and Hui as applied to claims 14 and 32 above, and further in view of Myr (US 20030014180A1).

- Regarding Claims 15 and 33,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts does not explicitly disclose congestion measurements carried out as a function of a local time, a number of priority packet bytes transmitted during a current measurement period, and a number of bytes that a dummy flow could send in said current measuring period.

Myr discloses managing congestion using system-wide signal timing, in which congestion is measured based upon actual travel times over a fixed control time period compared to the theoretical times over that same period, thereby forming a basis of an

optimization model for improving congestion at subsequent intervals (Abstract; claim 15,33 – congestion measurements are carried out as a function of a local time, a number of priority packet bytes transmitted during a current measurement period, and a number of bytes that a dummy flow could send in said current measuring period). Though the disclosure of Myr pertains to vehicular congestion through a given road network rather than communication network traffic congestion, Myr is analogous to Roberts and Hui for the general purposes of measuring and improving congestion.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the Roberts by making congestion measurements as a function of actual packet transmissions and theoretical transmissions over a timing-controlled measurement period, as shown by Myr. The theoretical times provide a reference point that would enable Roberts to determine if congestion occurs for a particular flow during a measured interval.

9. Claim 35 (as best understood) is rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts in view of Sundqvist, as applied to claim 19 above, and further in view of Shimojo et al. (US006643256B1), hereafter Shimojo.

- Regarding Claim 35,

Roberts discloses methods and devices for micro-flow management at switches in a communication network that meets all limitations of the parent claims.

Roberts discloses the use of discarding of packets of a particular flow as a way of achieving efficient QoS for users (Col. 3, lines 20-25). However, Roberts does not explicitly disclose sending a signal to a user relating to the loss of packets.

Shimojo discloses a packet switch using priority control based on congestion status within the switch (Title). Shimojo discloses notifying the user of packet loss due to congestion as a way of adjusting the rate to alleviate the congestion (Col. 1, lines 62-67; Col. 17, lines 35-64; claim 35 – signal relating to the loss of packets is sent to a user).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Roberts by notifying the user of discarded packets, as shown by Shimojo. This would enable the user to attempt retransmission of the packet while controlling congestion and maintaining QoS in the network.

Allowable Subject Matter

10. Claims 38 and 39 are allowed.

11. Claims 8 and 26 are dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims and also overcoming the pending 35 USC 112 rejections.

Response to Arguments

12. Applicant's arguments with respect to the pending claims on pgs. 11-13 have been considered but are moot in view of the new ground(s) of rejection.

13. Applicant's arguments on pg. 14 filed 6/9/2008 have been fully considered but they are not persuasive.

- In the Remarks on pg. 14 of the Amendment, Applicant contends that Roberts disclosure of terminating a flow contrasts with Applicant's claims, which remove non-active flows from the list of active flows to ensure that the next packet of that flow is handled with priority without terminating the flow, resulting in the flow being temporarily assigned a higher priority.

- The Examiner respectfully disagrees. It is noted that the features upon which applicant relies (i.e. erasing a flow from the list without terminating the flow) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, it is unclear how a flow can be "removed" from the list yet "remain" in the list of active flows, as alleged on pg. 14 of the Remarks. Therefore, the claim rejections are proper.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY B. SEFCHECK whose telephone number is (571)272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Chau Nguyen can be reached on 571-272-3126. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Gregory B Sefcheck/
Examiner, Art Unit 2619
9-3-2008